Castilleja linariifolia

Castilleja

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Restoring Shoshone Ancestral Food Gathering[1]

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Food sovereignty offers great hope for reclaiming and preserving knowledge of ancestral foods despite great loss in gathering and consumption of traditional foods among Indigenous communities. The Restoring Shoshone Ancestral Food Gathering (RSAFG) is a community group leading grassroots efforts to reclaim Shoshone ancestral foods and promote food sovereignty. The Shoshone people have treaty rights to land that is rich in resources like food and medicines. They have known and utilized these resources for thousands of years. These are ancestral lands. The work of reclaiming, of enacting ceremony before gathering together, processing and preserving plants and animal foods, and sharing Shoshone foods with community members strengthens self-determination and treaty rights.

For many years, Shoshone elders had been talking about ways to reclaim and restore ancestral foods that intersect with so many other important tribal issues and needs. In the fall of 2016, tribal elders put into practice the advice of the Tohono O'odham, who had worked to reclaim ancestral foods, when tribal members, along with a non-Indigenous ethnobotanist and a nutrition researcher, got together and sat in circle around a table. On the table were plants, tea and tinctures brought in from both tribal members and scientists. Since 2016, we met every month to share traditional recipes, stories and other food knowledge.

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Figure 1. Fireweed (*Chamerion angustifolium*)

Monthly RSAFG activities include a community get-together and an advisory meeting. Community gatherings focus on sharing stories, knowledge of traditional plants and foods, gathering plants that were part of a Shoshone diet, and processing and preserving plants together. Most gatherings are held at a local building with a kitchen for preparing and sharing food. We also meet and travel together to locations both within 1868 treaty reservation borders and on ancestral Shoshone lands in the Greater Yellowstone Ecosystem for digging roots, picking berries, and gathering plant leaves and stems. Figure 2 provides examples of community events led by the RSAFG. (Continued, p. 3)

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[1] Members of RSAFG will be featured speakers at the 2022 WYNPS annual banquet.

WYNPS News

2022 Wildflower Weekend – there's still time! Register this month for our June 3-5, 2022 event in Thermopolis with an amazing menu of hikes, a Saturday evening talk about "Restoring Shoshone Ancestral Food Gathering" and more. The schedule and registration form are in the previous issue and online: http://www.wynps.org/.

2022 Scholarship and Grant Winners Announced - Wyoming Native Plant Society is pleased to announce scholarship and grant winners for 2022. They include: "Wyoming Forests as Carbon Sinks; a Multi-day High School Outreach Program" (M. Lyford and K. Brummond - $450), "Native Plant Garden at Hot Springs County Courthouse" (Red Dirt Master Gardeners - $500), and "Can Noise from Wind Turbines affect Pollination and Pollinators?" (M. Weschler - $500).

New WYNPS Board – 2022
President: Kristy Smith, Pinedale (smith.kristy217@gmail.com)
Vice-President: Maggie Eshleman (maggieeshleman@gmail.com)
Sec.-Treasurer: Dorothy Tuthill, Laramie (dtuthill@uwyo.edu)
Board-at-large: Paige Wolken, Cheyenne (paigewolken@yahoo.com) (2021-'22)
Greg Pappas, Laramie (gregory.pappas@usda.gov) (2022-'23)

Teton Plants Chapter of WYNPS teamed up with U.S. Postal Service in Jackson, Wyoming, for a March 14 First-Day Ceremony marking the new Mountain Flora stamps.

Other Contacts:
Editor: Bonnie Heidel (bheidel@uwyo.edu)
Webmaster: Maggie Eshleman (maggieeshleman@gmail.com)
Sublette Chapter: Jill Randall, President (possum1b@yahoo.com)
Teton Plants: Amy Taylor, Treasurer; (tetonplants@gmail.com). Check the chapter homepage (https://tetonplants.org/) for upcoming events.

New Members: Please welcome the following new members to WYNPS: Karen Hepp, Worland; Julie Holding, Jackson; Mitchell McClosky, College Place, WA; Larry Pixley, Cheyenne; Lenore Poitras, Lander; Jacque Strike, Pinedale.

WYOMING
NATIVE PLANT SOCIETY'S
WILDFLOWER
WEEKEND
June 3 – 5 in Thermopolis
Registration is $20/day or $40 for the weekend. More information including schedule and registration at wynps.org
Friday highlights: plant families workshop, wildflower walk at Hot Springs State Park
Saturday highlights: wildflower walks at Copper Mountain Wilderness area, Tensleep Preserve and plant collection event with Rocky Mountain Herbarium. Keynote talk by Restoring Shoshone Ancestral Food Gathering
Sunday highlights: wildflower walks at Heart Mountain Preserve, Roundtop Mountain and Birdseye Pass

Register at http://www.wynps.org or by mail

Treasurer's Report: Balance as of May 2: Scholarship = $1680; General = $11, 090; Total = $12,770.

Next issue: Please send articles by 15 Sept to:

Wyoming Native Plant Society
P.O. Box 2449
Laramie, WY 82073

Contributors to this Issue: Robert Dorn, Bonnie Heidel, Greg Pappas, Meredith Taylor, Dorothy Tuthill, Sienna Wessel, and authors for the RFASG Community Group.

Social Media: We are on Facebook as Wyoming Native Plant Society and Instagram as @wyomingnativeplantsociety. Follow us on either platform for WYNPS updates and native plant content.

RSAFG Community Events
Late Spring, Summer, and Early Fall
Picking berries (buffalo, chokecherry, hawthorne)
Collecting pine cones (limber pine)
Digging for roots (biscuitroot, sego lily, yampah)
Gathering plants for teas (fireweed)
Fall and Winter
Drying/dehydrating collected plants and berries Using dried plants in tea-making
Pounding/grinding roots into flour Preparing recipes for ground flour
Sampling and sharing recipes

(Restoring Shoshone Ancestral Food Gathering, *cont. from p. 1*)

The story of the RSAFG promotes equitable, decolonized, and community empowered methods of reclaiming Indigenous foods. For more information, please see the group's published paper "Enacting Treaty Rights through Restoring Traditional Shoshone Foods on the Wind River Indian Reservation" here: https://doi.org/10.1080/10875549.2021.1953674-

Figure 2. Example of community events that are part of the work of the Restoring Shoshone Ancestral Food Gathering group.

Why iNaturalist? By Greg Pappas

Have you ever found yourself staring at an unknown plant, perplexed, wishing you knew what it was? Do you enjoy learning about the biodiversity around you? Do you have a smartphone? …If you answered yes to any of these questions, you're primed to start using iNaturalist—the powerful citizen science tool where science, curiosity, love of nature, conservation, and community all come together under one easy-to-use platform. With over two million users, iNaturalist has become of one the most popular species-data- and photo-sharing tools, connecting an assortment of nature enthusiasts from across the globe. Consisting of a mobile app and corresponding website, iNaturalist has been helping to improve our understanding of the natural world since its inception as a student project at UC Berkeley's School of Information in 2008. Although I am a relative newcomer to iNaturalist, having joined in 2020, it didn't take long to realize the benefits and remarkable capabilities of this online social network.

I want to encourage the wide use of iNaturalist by highlighting several reasons to join in the species-cataloging fun! I also hope that this article will serve as a catalyst for future conversations surrounding its potential uses or applications in Wyoming.

Signing up and using is simple and straightforward. There are two basic steps to begin using iNaturalist. First, create an account on the website (https://www.inaturalist.org/signup), then download the app on your smartphone (make sure you get the iNaturalist app and not the "Seek by iNaturalist" app). Technically you don't need the mobile app to use iNaturalist (you can use the website on your computer if you can provide a photo, date, and location); however, using your smartphone is convenient because it automatically tags photos with GPS coordinates and a timestamp—just make sure your phone's settings allow location access to the camera.

With these steps complete, you are ready to start making observations. For the best chance at getting an accurate identification, take multiple photos of different plant parts and from different angles. It is good practice to take a habit shot (i.e., the whole plant) showing some of the background, along with shots of the plant base, upper and lower leaf surfaces, and flowers (including closeups of any reproductive parts). After adding photos in the app, you can choose what you saw by either typing in the name or selecting one of the computer vision suggestions. For the latter, iNaturalist uses artificial intelligence to compare the

composition of the organism in your photo to the entire database of photos with confirmed identifications. These computer vision suggestions work surprisingly well for many of the common species, but generally it is not a good idea to simply select them without being fairly confident in the identification. The suggestions are particularly helpful in instances where you may not even know what family the plant is in—I find that the computer model usually at least points you to the correct genus. The location of your observations should automatically be added, but you can always change it or choose to obscure or make private the coordinates. You will notice that some organisms with designated conservation statuses are automatically obscured by iNaturalist. Also, you have the option to check "Captive /Cultivated." Most of the time you will leave the default (no) selected because iNaturalist is primarily about observing wild organisms, not those in zoos, gardens, or specimen drawers. For additional help and information, the iNaturalist website contains many useful video tutorials and resources for getting started.

In the iNaturalist app settings, you will probably want to turn off the automatic upload option, so that you can upload manually whenever you're ready. Once uploaded, anyone can view your observation, but only those with an account can comment or suggest an identification. The fate of your organism's identification is now up to the community. When more than 2/3 of identifiers agree on a species, the observation reaches "Research Grade" status, which means it is now suitable to be shared with iNaturalist's data partners and used by scientists. And just like that, you're officially a citizen scientist!

It will make you a better botanist. Start spending some quality time on iNaturalist and you'll quickly notice your plant identification skills improving! Being able to easily compare detailed characteristics between species by looking at numerous high-resolution photos, enables you to glean much more information than you can get from viewing photos of digitized herbarium specimens. This means you can often effectively identify plants from the comforts of your home at any time of year. So, just brew your coffee, grab your favorite dichotomous key, and start botanizing! Then, through the process of identifying your observations and those of others, you'll begin to learn more and more new species and their distinguishing features. In addition to honing your plant ID skills, iNaturalist may also help you follow new taxonomic developments, range extensions, phenological observations, and habitat associations of known species in real time. For example, I have documented several new county records on iNaturalist[2]. Once uploaded, these observations were immediately available for the world to see, whereas it may take years for a collected specimen to be processed and incorporated into an online herbarium database. Lastly, I have found that perusing iNaturalist observations is a fantastic way to stay connected to nature and get your "plant fix" during the long winter months when you're itching to get back outdoors.

Being part of a nature-oriented community is refreshing and fun. In my experience, the atmosphere of the iNaturalist community is both professional and lighthearted. User comments can range from expert insights to great plant-related jokes! I enjoy becoming familiar with some of the users' interests and projects and appreciate being able to build relationships by simply interacting through identifications and comments. Also, iNaturalist provides the option to follow people to keep track of the observations they've been posting. This is a great way to stay connected. Plus, having more followers usually increases the likelihood that your observations will get identified. Finally, I think a universal, yet often unsaid sense of unity comes with any joint effort to explore and document our planet's diversity of organisms.

Possibilities abound for collecting and using data. iNaturalist offers a suite of handy features such as the ability to join projects, subscribe to a taxon/place, create lists, etc. Projects allow users to create groups of observations to support an area of interest (e.g., specific group of plants, geographic area, or event). iNaturalist is particularly well-suited for use in BioBlitzes, communal surveying efforts to record as many species as possible in a specific location.

Aside from the fundamental recording of occurrences, iNaturalist can also be used to inform about an organism's spatial distribution, patterns and trends, habitat relationships, and responses to disturbance or climate/land use change. This is certainly just a short list of potential uses. At the time of writing, 2,334 publications had cited a Global Biodiversity Information Facility dataset containing iNaturalist records. There's no limit to the number of

[2] Photos do not take the place of specimens as unequivocal scientific documentation, but enable the nonprofessionals to participate in the discovery process.

important and interesting questions to be answered using your observations. If you record it, the analyses will come!

Final thoughts. iNaturalist has an important niche for everyone from skilled biologists and taxonomists to novice naturalists. Therefore, its full potential can only be met through the dedicated cooperation of this diverse set of users. In the face of increasingly complex environmental challenges and the uncertainty associated with a changing climate, iNaturalist stands to be a reliable tool and source of critical information. It is compelling to know that the future value of iNaturalist as a learning, research, and conservation tool, depends directly on the quantity and quality of user input. With iNaturalist, you are part of a community working to better understand and protect nature one upload at a time. So, the next time a plant catches your eye, snap a few photos, and share the beauty and wonder with iNaturalist and all its fellow users!

Steppe-ing up restoration success: drivers and variation in restored sagebrush steppe

By Sienna Wessel, Department of Botany, University of Wyoming

Many arid-land restoration projects fail to establish important native species or meet ecosystem targets. For example, one study of native sagebrush steppe plantings found that 90% of individuals died before seedlings fully emerged (James et al. 2012). Even when a restoration seeding plan is highly successful in one site or year, it may fail entirely under slightly different conditions.

Figure 1. Grand Teton National Park sagebrush steppe community with a diverse understory of forbs and grasses. By the author.

This variation in restoration outcomes is something that ecologists must untangle and explain if we want the capacity to forecast and control restoration success in the future. Luckily we can turn to theories in community assembly and functional trait ecology to increase our understanding of the processes that dictate which species will establish and persist within a community. These theories tell us that plant communities are ultimately a result of environmental filtering processes that only "allow" species that possess traits that are well adapted to surrounding conditions to survive (Funk 2021). For example, species with thinner, cheaply produced leaves may establish quickly and compete well in moist conditions but fail altogether in a drought. Therefore, we might expect that the conditions present at the time of restoration initiation, such as soil properties and climatic conditions, will have strong impacts on the traits and species that appear in a restored community.

Thanks to the support of the Wyoming Native Plant Society and other supporting partners, I tested some of these concepts at a large-scale restoration project in the Antelope Flats (or Mormon Row) section of Grand Teton National Park. Around 25% of the Park is still comprised of healthy and diverse steppe of two types: a dry sagebrush shrubland dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with a variety of perennial grasses and forbs, and a mixed shrubland co-dominated by sagebrush and bitterbrush (*Purshia tridentata*). However, Antelope Flats was converted to hayfields of smooth brome (*Bromus inermis*) by settlers in the 1800s. It is an important migratory bottleneck for ungulates and mating ground for the threatened Greater sage-grouse (*Centrocercus urophasianus*). Little natural recovery happened in this area, so the Park seeded thirteen different sites between 2009 and 2017 with different mixes of native species and established a monitoring program to record community responses.

My grant funding went towards field supplies and gas for two summers of collecting data that built on the long-term monitoring dataset and included measurements of five traits from the leaves, seeds, and whole plants of 70 species. I used the line-point intercept method to measure species abundances and also determined selected species' traits such as seed mass, traits related to leaf economics, drought tolerance, competition, and dispersal. I then assessed species and trait changes through time, across sites, and in comparison to undisturbed steppe communities (reference sites) nearby. (Cont. p. 6)

Figure 2. Sienna Wessel collects data in a restoration site within Grand Teton National Park. Photo by Daniel Laughlin.

I also combined these data with soil core analyses and climate data to determine which environmental factors best explained variation in several different measures of restoration success.

Our results showed that restored communities generally trended towards the species composition of healthy reference sites over time but reached a maximum similarity of 15% similarity after a decade. Traits partially overlapped with target values in early years and did not clearly become more or less similar through time. Overall, restored communities were more invaded and dominated by seeded graminoids like mountain brome (*Bromus marginatus*) and slender wheatgrass (*Elymus trachycaulus*) instead of perennial forbs and shrubs common to reference sites, including sulfur buckwheat (*Eriogonum umbellatum*) and silky lupine (*Lupinus sericeus*). This resulted in a higher level of resource conservative, drought tolerant traits and a greater presence of shorter species with lighter seeds than seen in the reference. Temporal trends were frequently explained more by community age than other factors. However, we found that restoration outcomes were secondarily dependent upon soil and climatic variation between seeding years--even more so than seed mix design. Climate is not usually explicitly considered during restoration planning but our study demonstrated that post-seeding snow depth and summer temperature explained a significant amount of variation across multiple metrics of restoration success, especially for traits.

Why is this important? The sagebrush steppe is an iconic landscape of Wyoming and the American West. Though often overlooked, sagebrush adorns the scenes of the most famous westerns and pioneer films and is deeply ingrained in Americana. For many, songs where "the deer and the antelope play" render images of foothills and plains dotted with browsing animals and specks of silvery-olive colored sagebrushes (any of more than a dozen keystone species and subspecies of *Artemisia*) as far as the eye can see. This strange and surprisingly diverse ecosystem (a total of 101 plant species at my study sites!) thrives between the climatic boundaries of forest and grassland where snow is the predominant form of precipitation. More importantly, it also supports at least 65 threatened plants and nearly 350 different vertebrate species-some of which live nowhere else in the world (Wisdom et al. 2002, Rowland et al. 2011).

All too often I have heard that "the stuff's everywhere!" and "what's so special about sagebrush?" when I bring up my work on steppe restoration. Sadly, such a view of how things are going in the steppe misses the bigger picture fact that nearly 50% of this important American ecosystem has already been lost or is well on its way to becoming a ghost of its former self (Miller et al. 2011). The reality is that the steppe is in danger and the challenges are growing by the minute. Numerous acres are converted to cropland and well-pads each year. Boots and tires bring cheatgrass (*Bromus tectorum*), cheatgrass encourages more frequent fire, and fires mutate the landscape from shrubland to homogenous, degraded grassland. Decreased snowpacks and warmer temperatures also threaten the livelihoods of deep-rooted perennials.

It is becoming increasingly clear that we need effective, science-based practices for restoring biodiversity but there is still a lot of ambiguity surrounding best approaches, and changing conditions only compound the challenges. This is especially true in arid and semi-arid ecosystems like the sagebrush steppe with water budgets that are in danger of tipping towards the point of no return, leading to complete system change. Successfully controlling the re-assembly of an entire plant community made up of dozen of species is certainly no easy feat.

This study provides valuable and interesting insights that could help increase sagebrush steppe restoration success in the future. On a positive note, we found evidence for some natural progress towards targets regardless of establishment conditions. However, it is also likely that success could be improved by strategizing timing of planting and site selection based on climatic variation and soil

properties. Managers could develop metrics of success based on traits that respond predictably to environmental conditions. Furthermore, it should be anticipated that ongoing regional temperature increases and snowpack declines will alter restoration outcomes. There is still a lot of work to be done and many questions must be answered before we will be able to make clear predictions about restoration outcomes based on establishment conditions. Still, I am thankful for this opportunity to be part of a force for good for the amazing sagebrush steppe communities that greeted me daily with boisterous balsamroots (*Balsamhoriza sagittata*), luxurious lupines, and peculiar paintbrushes (the namesake *Castilleja* spp.) for two wild summers.

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Ethnobotany – Part 2. ***Rosa woodsii***

By Meredith Taylor

Woods' rose (*Rosa woodsii*) is among 2500+ species and 90+ genera in the Rosaceae family of flowering plants. It is a native perennial shrub that usually grows in dense clumps to a height of 3 to 10 feet (1-3 m). The stems have curved thorns from .1 to .2" (3 to 6 mm) long. The leaves are pinnate and alternate, 0.5 to 5" (1.5-13 cm) long, and 0.1 to 1" (0.4-2.5 cm) wide. There are 5 to 9 leaflets about 2" (5 cm) long and 1" (2.5 cm) wide. Woods' rose grows at 3000-9000' (1000 -3000 m) elevation.

The inflorescence of Woods' rose is few-flowered and often solitary or in small clusters. The pink flowers are 5-petaled, 0.5 to 0.75" (1.5-2 cm) long. Woods' rose hips are about 0.25 to 0.5" (0.75-1.5 cm) occur in clusters. The fleshy part of the hip is the enlarged hypanthium, which encloses 15 to 35 small, nut-like fruits (achenes). The root crown is relatively shallow and roots reach a depth of 1 to 6'. Woods' rose regenerates via seeds and from the root crown by suckering. The pink flowers bloom May – July in riparian habitat. It is important for early pollinators.

Rose hips are edible as are rose petals. Rose petals make a delicious tea as well as a soothing skin cream. Rose hips are important medicinally and have the highest concentration of vitamin C (1000-2500 mg/100 g), much more than an orange (50 mg/100 g). They are best eaten raw to maximize the vitamin C content. Rose hip tea is a popular hot drink during the cold and flu season. Early people made rose hip jam and jelly and native people used rose hips as fruit in pemmican to store for winter with dried meat. Rose hips have no toxic lookalike fruits, so they may be eaten without concern. However, the fine hairs around the seeds are irritating and may be removed easily when separating the fruit from the seeds. The seeds may be ground to use as a poultice for relieving muscle pains.

A wild rose leaf infusion makes a refreshing spring tonic and is an excellent anti-inflammatory treatment for auto-immune conditions. Rose hips were also used by early explorers to prevent and treat scurvy. The sweetest rose hips are best gathered after the first frost in the fall when the sugar has matured in the fruit. Birds, bears and other animals value the delicious fruits, so it's important to only pick what you need and leave plenty for wintering wildlife.

(*Editor's note: This article is for educational purposes and does not condone collecting of plants that readers cannot*

identify with certainty. Ethical wild plant collecting follows practices that tread lightly. See those posted below: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3822046.pdf . Check directly with the agency about their policies if you want to harvest native plants on public lands.)

Growing Native Plants

Part 44. More Forbs for Dry to Moist Sites

By Robert Dorn

Cryptantha thyrsiflora, Cluster Miners-candle, is a perennial to 16 inches tall and 10 inches wide. The leaves are narrow and to 4 inches long. The flowers are white, to 0.25 inch across, and in a broad inflorescence along the upper one-half to two-thirds of the stems. They appear in June and July. The plants occur naturally in dry, open places on the plains. They prefer full sun and dry, well drained soils. It can be grown from seed surface sown in the fall outdoors.

Cryptantha thyrsiflora, Platte Co.

Lewisia rediviva, Bitterroot, is a perennial to 2.5 inches tall and wide with one to several stems. The leaves are all basal, fleshy, narrow, and to 2 inches long. The flowers are light pink to rose-pink, to 2.5 inches across, with 12 to 18 petals, and solitary at the tip of the leafless stems. They appear from May to July. The plants occur naturally in moist to dry, open places in the basins, valleys, and mountains. They prefer full sun and moist to dry, well drained soils and are drought tolerant once established. They should be kept moist while flowering and kept dry in winter if the ground is not frozen It can be grown from seed sown outdoors in the fall or cold stratify for 90 days or more for spring planting Barely cover the seeds with soil. Plants and seeds are commercially available.

Lewisia rediviva, Carbon Co.

Lupinus plattensis, Platte Lupine, is a perennial to 2.5 feet tall. The leaves are palmately compound with 6 to 10 leaflets to 3 inches long. The flowers are bicolored white and purple, to 0.5 inch long, and arranged along the upper stem above the leaves. They appear from May to July and sometimes into August. The plants occur naturally in moist to dry, well drained open places on the plains. They prefer full sun and moist to dry, sandy or well drained soils. It can be grown from seed sown 0.25 inch deep or less. Scarify the seed before planting.

Lupinus plattensis, Platte Co.

Penstemon grandiflorus, Largeflower Penstemon, is a perennial to 3 feet tall and 12 inches wide with one to several stems. The leaves are opposite, to 7 inches long and 2 inches wide, and bluish-green in color. The flowers are pink to pale blue or blue-purple, to 2 inches long and 1 inch across, and in scattered clusters along the upper third of the stem. They appear from

April to July depending on elevation. The blooming period is only about 2 weeks. The plants occur naturally in open prairies and open woods on the plains and in the Black Hills and Big Horns. They prefer full sun to light shade and slightly moist to dry, well drained sandy loam and are drought tolerant. They may be short lived in cultivation but reseed readily. It can be grown from seed sown outdoors in the fall or cold stratify for 60 days or more for spring planting. Cultivars are available in the nursery trade.

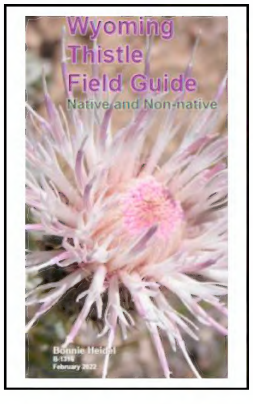
Symphyotrichum falcatum, Goshen Co.

Penstemon grandiflorus, Lawrence Co., SD

Symphyotrichum falcatum, White Prairie-aster, is a perennial, often with rhizomes, to 15 inches tall and wide with several to many stems. The leaves are very short and narrow. The flowers heads have white rays and yellow disks and are about 0.75 inch across and scattered along the upper stems. They appear in August and September. The plants occur naturally in dry to moist, open areas in the plains, basins, valleys, and mountains. They prefer full sun and dry to moist, well drained soils. It can be grown from seed as soon as it is mature. Sow 0.25 inch deep or less.

To see the above plants in color, go to the newsletter on the Society website.

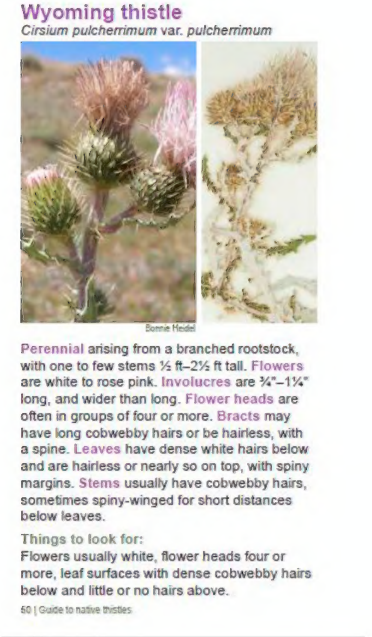
Guide to Wyoming Thistles Now Available



Wyoming Thistle Field Guide; Extension B-1316; by Bonnie Heidel. 72 pp. spiral binding. $4.50 + shipping.

A new guide to native and non-native thistles of Wyoming, including species of *Carduus*, *Cirsium* and *Onopordum*, is in print this spring. It is a tool for distinguishing between invasive species that include some of our most serious noxious weeds, and the array of natives that dot Wyoming landscapes. Copies are now available from the Biodiversity Institute (https://wyobiodiversity.net/) and the Wyoming Weed and Pest Council (https://wyoweed.org/).

This pocket-size guide is written for a wide audience, from professional botanists, land managers and weed crews, to landowners, conservationists and plant enthusiasts.


Wyoming thistle
Cirsium pulcherrimum var. *pulcherrimum*

Perennial arising from a branched rootstock, with one to few stems ½ ft–2½ ft tall. Flowers are white to rose pink. Involucres are ¾"–1¼" long, and wider than long. Flower heads are often in groups of four or more. Bracts may have long cobwebby hairs or be hairless, with a spine. Leaves have dense white hairs below and are hairless or nearly so on top, with spiny margins. Stems usually have cobwebby hairs, sometimes spiny-winged for short distances below leaves.

Things to look for:
Flowers usually white, flower heads four or more, leaf surfaces with dense cobwebby hairs below and little or no hairs above.

60 | Guide to native thistles

RM Launches K-12 Education Initiative

The Rocky Mountain Herbarium has long welcomed students of all ages into its hallowed halls. Now, the RM is becoming accessible to classrooms across the state that cannot travel to Laramie. Graduate student Matt Bisk, a former classroom teacher currently completing a Masters degree in Natural Science Education, took on the task of developing several lessons that utilize RM resources to meet state science standards – with lesson plans available online in addition to an educational kit that enhances the hands-on learning.

One of the lessons asks students to address the question "Why has cheatgrass spread so far in Wyoming since the early 1900's?" Using images of selected specimens, they are able to compare the traits and adaptations of cheatgrass to those of other Wyoming species, and make connections to specific environments, human behavior, and their own community. In addition, the classroom kit can be reserved from RM to get life-size prints of specimens, a plant press, books, and other materials. More information can be found at http://rockymountainherbarium.org/index.php/education.

WYOMING NATIVE PLANT SOCIETY MEMBERSHIP FORM

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[ ] Annual membership with scholarship support and mailed newsletters: $22
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In addition to the statewide organization, we have two chapters. Membership in chapters is optional; chapter members must also be members of the statewide organization.

[ ] Teton Plants Chapter annual membership: $5
[ ] Sublette Chapter annual membership: $5
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Total enclosed: _____

Please write checks to **Wyoming Native Plant Society**

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